



Филиал МГУ имени М.В.Ломоносова
в г. Ереване

Журнал входит в список
периодических изданий ВАК РА

ՌՈՒՍԱԳԻՏՈՒԹՅԱՆ ԱՐԴԻ ՀԻՄՆԱԽՆԴԻՐՆԵՐԸ

Գիտամեթոդական հանդես

ПРОБЛЕМЫ СОВРЕМЕННОЙ РУСИСТИКИ

Научно-методический журнал

MAIN ISSUES IN MODERN RUSSIAN STUDIES

Scientific Methodological Journal

ИМПЛЕМЕНТАЦИЯ ПОДХОДА ПРЕДМЕТНО-ЯЗЫКОВОГО ИНТЕГРИРОВАННОГО ОБУЧЕНИЯ /CLIL/ НА НАУЧНО-ТЕХНИЧЕСКИХ ФАКУЛЬТЕТАХ /STEM¹/

Мери Самвеловна Есаян

 ORCID: [0009-0000-2793-0660](https://orcid.org/0009-0000-2793-0660)

meri.esayan@rau.am

*К.п.н., доцент,
Доцент кафедры теории языка и межкультурной коммуникации,
Российско-Армянский университет,
Ереван, Республика Армения*

АННОТАЦИЯ

В данной статье рассматривается преподавание иностранного языка на факультетах STEM в рамках предметно-языкового интегрированного обучения /CLIL/. При имплементации данного подхода язык и содержание изучаются одновременно с использованием метода интеграции. Это хорошая возможность для студентов улучшить свои языковые навыки, не пренебрегая знаниями по профессиональным предметам. Учитывая особенности подхода CLIL, преподаватель может развивать не только языковые навыки – чтения, говорения, аудирования и письма, а также углублять знания в профессиональной сфере на иностранном языке.

Ключевые слова: предметно-языковое интегрированное обучение, языковые навыки, профессиональный контент, STEM образование.

¹ Science, technology, engineering, and mathematics (STEM) is an umbrella term used to group together the distinct but related technical disciplines of science, technology, engineering, and mathematics.

It is an undeniable fact that the first prerequisite for the development of the country's living standard and economy is to have powerful science, skilled specialists and a motivated young generation. The place and role of education are paramount, especially when pursuing long-term goals. In creating the above-mentioned ideas, it is important to emphasize the importance of STEM (Science, Technology, Engineering, Mathematics) education across all layers of society, which will create new perspectives for the development of our country, and establish new connections through the exchange of experience with foreign partners in this field.

Exact sciences sound more attractive when presented in the international language of science. English, as a *Lingua Franca*, is in demand in all fields. Knowledge of English is indispensable in STEM education, as it facilitates communication within the scientific community, access to resources, international cooperation, career growth, and the effective presentation and publication of research results. Professional knowledge alone is not enough to succeed in the STEM field; mastering a foreign language is imperative today.

It is well-known that many European countries show great interest in integrated language and content teaching. Armenia is also keeping pace with this process. The introduction of English for Special Purposes (ESP) began back in the 1960s [1: 5–10], when there was a demand for specialists teaching in narrow professional fields who could ensure simultaneous knowledge of professional subjects and a foreign language. This is one of the rare cases where a specialist masters both the language and the given professional subject equally.

Drawing parallels between General English and English for Special Purposes (ESP), we can state that while the main goal of a general English course is to develop all four language skills equally, an ESP course should prioritize the language requirements and goals related to specific professional fields.

According to Dudley-Evans, ESP is tailored for intermediate or advanced students, a viewpoint with which we definitely agree [4: 5]. Therefore, ESP should be implemented only after the completion of a General English course.

As for the methodology of the ESP course, the Content and Language Integrated Learning (CLIL) approach should be applied in the classroom. Cross-content learning enables students to transfer their already familiar knowledge to another domain, specifically to the field of a foreign language. This is an example of integrated language and content learning [3].

Within the CLIL methodology, students study language and content simultaneously, using an integration method that supports content learning. Here, the foreign language serves as a tool to facilitate this process.

According to Nikula, the basis of CLIL is «the teaching of a non-linguistic subject through a foreign language, thereby improving knowledge of both the foreign language and the subject» [8]. This approach provides an excellent opportunity for students to develop their foreign language skills while also deepening their understanding of the professional subject.

However, it should also be noted that the teaching methodology of language and content integration brings with it a number of difficulties.

Language learning is an interactive, dynamic process in which the acquisition of knowledge is more effective if students study materials and sources in a flexible educational environment. This approach is not limited to a specific subject but encourages drawing conclusions by integrating previous and newly acquired knowledge. This is defined as learning and thinking in language, which Lund and Ruschoff attribute to «the linguistic dimension of language learning, consisting of several elements, including reflection on learning progress, sociocultural competence, and functional-semantic categories» [6].

However, it should be noted that the teaching methodology of language and content integration presents several challenges.

Firstly, the foreign language educator may not be familiar with the professional subject itself – in our case, STEM subjects. As a result, the educator serves only as a «means» to convey the content. ESP educators are specialists in English, not in other scientific fields, and they may have only superficial knowledge of the given field. This issue does not arise in the integrated teaching of language and content, where teachers must be specialists in the subject with a good command of English.

Secondly, as Nation points out, teaching professional or technical vocabulary in isolation, out of context, is a futile effort and should be studied alongside the subject material [7]. Therefore, English specialists must continuously study and deepen their knowledge of the field of science being taught – in our case, natural and technical subjects.

Some scholars who study language in context argue that language has various uses, both practical and formal, which can change according to context [5]. This does not mean that the ability to use language correctly in one context will be reflected in the same way in another context. Each discipline implies specific content, terminology, and technical vocabulary [9: 27–38]. It is the knowledge of professional vocabulary, grammatical structures, and functional expressions that is required of a foreign language teacher in CLIL.

For example, a foreign language specialist teaching in the STEM field is required to:

1. Explain scientific phenomena and their applications in simpler and more creative ways to aid students' quick understanding.
2. Be prepared to answer questions related to scientific concepts that may be unfamiliar to students (e.g., the difference between speed and acceleration).
3. Continuously expand their knowledge of scientific vocabulary, its pronunciation, and word formation.
4. Since educators are dealing with a specific branch of science, it is advisable for them to incorporate features and patterns of English for

Academic Purposes (EAP) into the teaching process, focusing on both vocabulary interpretation and grammatical patterns.

In the context of language and content integration learning, it is necessary to consider the 4Cs principle developed by Coyle [2], which includes content, communication, cognition, and culture.

1. **Content** – What is the subject/content of the given class? In our case, for example, energy.

2. **Communication** – What scientific methods will students use during the course? For instance, methods of comparison and contrast to analyze the similarities and differences between the types of energy that exist in physics.

3. **Cognition** – What thinking skills are required of students in physics class? For example, by classifying the types of energy, they can define their fields of application.

4. **Culture** – (sometimes the 4th C is attributed to Community or Citizenship). Is there a specific national approach to the subject under discussion? For example, what is the main source of energy produced in this country? Discuss the conditions when it is preferable to use solar energy instead of hydropower or wind energy.

Thus, in the case of integrated language and content learning, it is important to develop the following skills in students:

- **Language skills:** All four skills—speaking, listening, writing, and reading.

- **Cognitive skills:**

- **Critical thinking:** Encourage students to analyze, evaluate, and generate new ideas based on the content and language they are learning.
- **Problem-solving:** Develop the ability to solve problems using the knowledge and language skills they have acquired.
- **Creativity:** Foster innovative thinking and the ability to generate unique ideas and solutions through both content and language.

- **Content knowledge:**

- **Deep subject knowledge:** Provide students with a solid foundation in the taught subject.
- **Interdisciplinary understanding:** Encourage connections between different disciplines and integrate knowledge across them.
- **Cultural understanding.** Develop awareness of cultures related to a foreign language.
- **Intercultural communication.** improving the ability to communicate effectively and appropriately with professionals from different cultural backgrounds.

Based on the specifics of the language and content integration method, it is necessary to organize the lesson in the following sequence.

The student is first introduced to the vocabulary of the material presented both in writing and orally. The given vocabulary is mastered through a series of language exercises, such as, for example, describing an object, predicting a phenomenon, etc. Describing exercises enable the student to develop verbal skills, critical thinking, using their active vocabulary of the foreign language. Some phenomena in physics can be explained purely from everyday life experience, thus expanding the active everyday vocabulary. For example, everyday questions about light and sound.

- What would happen if the speed of light slowed down?
- How can the noise (echoes) be reduced in the university hall?
- Explain why the flower stem in the glass vase looks bent.
- Describe what happens when sound waves meet an obstacle.

When planning each lesson, it is necessary to ensure in advance, through an oral survey, that the students have mastered the functional language characteristic of the given lesson, first in their mother tongue and then in English.

To develop writing skills, it is preferable for students to work on a common project. They should first present individual works or presentations, and then compare them with their classmates' projects. These projects can involve research from different professional fields, such as describing a laboratory experiment, solving a problem, or presenting information about an important scientific discovery.

To develop listening skills, we consider it advisable to use TED talks, vodcasts, and podcasts. These provide a good opportunity to listen to related topics presented in the classroom. The teacher can then ask prepared questions to determine the students' level of understanding of the material.

Most of the current literature on natural and technical sciences is in English, which gives STEM students an advantage. Reading materials can be sourced both from the internet and specialized literature used in the classroom by an ESP specialist.

All of the above teaching approaches, which develop all four language skills, contribute to the development of students' cross-examination of the language and the given discipline.

In summary, applying the methodology of language and content integration (CLIL) in the ESP classroom positions the educator as a trainer or resource rather than a carrier of knowledge of the given profession. The students themselves, through active participation, accept or reject the presented material and often guide the language specialist in choosing the right content direction. Even in such a mixed educational environment, the effectiveness of CLIL is revealed.

ЛИТЕРАТУРА

1. *Apresyan M.* Are there any CLIL schools in Armenia? // In «Windows on CLIL» Content and Language integrated learning in the European Spotlight Graz, Austria, 2005. – PP. 9–14.
2. *Coyle D.* Supporting students in content and language integrated learning contexts: planning for effective classrooms. London: CILT, 1999. – PP. 46–62.

3. *Darn S.* Content and Language Integrated Learning (CLIL). A European Overview (2006), ERIC [Electronic resource]. – Mode of access: https://archive.org/details/ERIC_ED490775 (Date of access: Sep 15, 2024).
4. *Dudley-Evans T. & St. John M.J.* Developments in English for Specific Purposes. – Cambridge, Cambridge University Press, 1998. – 301 p.
5. *Halliday M.A.K., Hasan R.* Language, context and text: a social semiotic perspective. Geelong, Vic.: Deakin University Press, 1985. – VI, 126 p.
6. *Lund A., Rüschoff B.* New technologies and language learning: theoretical considerations and practical solutions in information and communication technologies (2003) // In Fitzpatrick T., Lund A., Moro B., Rüschoff B. (eds). Vocationally Oriented Language Learning, Council of Europe Publishing, Graz. (2009).
7. *Nation P.* What Should Every EFL Teacher Know? – Seoul, Compass Publishing, 2013. – 240 p. [Electronic resource]. – Mode of access: <https://eb.com-passpub.com/v1/pre-view/What%20Should%20Every%20EFL%20Teacher%20Know/mobile/index.html#p=4> (Date of access: Sep 15, 2024).
8. *Nikula T., Marsh D.* Terminological Considerations Regarding Content and Language Integrated Learning. University of Jyväskylä Continuing Education Centre, Jyväskylä, 1997. – PP. 13–18.
9. *Snow M.A., Met M. & Genesee F.* A conceptual framework for the integration of language and content instruction // In P.A. Richard–Amato and M.A. Snow (eds). The multicultural classroom: Readings for content–area teachers. – New York: Longman, 1992. – PP. 27–38.

**ԼԵԶՎԻ ԵՎ ԲՈՎԱՆԴԱԿՈՒԹՅԱՆ ԻՆՏԵԳՐՎԱԾ ՈՒՍՈՒՑՈՒՄ
/CLIL/ ՏԵԽՆԻԿԱԿԱՆ /STEM/ ՖԱԿՈՒԼՏԵՏՆԵՐԻ
ՇՐՋԱՆԱԿՆԵՐՈՒՄ**

Մ.Ս. Եսայան

 **ORCID:** [0009-0000-2793-0660](https://orcid.org/0009-0000-2793-0660)
meri.esayan@rau.am

Մ.գ.թ., դոցենտ,

Լեզվի տեսության և միջմշակութային հաղորդակցության ամբիոնի դոցենտ,

*Հայ-ռուսական համալսարան,
Երևան, Հայաստանի Հանրապետություն*

ԱՍՓՈՓՈՒՄ

Սույն հոդվածն ուսումնասիրում է օտար լեզվի դասավանդումը STEM ֆակուլտետներում՝ բովանդակության և լեզվի ինտեգրված ուսուցման (CLIL) շրջանակներում: Բովանդակության և լեզվի ինտեգրված ուսուցման շրջանակներում լեզուն և բովանդակությունը միաժամանակ ուսումնասիրվում են ինտեգրման մեթոդով: Սա լավ հնարավորություն է ուսանողների համար բարելավելու իրենց լեզվական հմտությունները՝ չանտեսելով մասնագիտական առարկաների իրենց գիտելիքները: Հաշվի առնելով CLIL-ի բոլոր մոտեցումները՝ մասնագետը լսարանում կարող է զարգացնել ոչ միայն բոլոր չորս լեզվական հմտությունները, այլև մասնագիտական բովանդակությունը օտար լեզվով:

Բանալի բառեր՝ բովանդակություն և լեզվի ինտեգրված ուսուցում, լեզվական հմտություններ, մասնագիտական բովանդակություն, STEM կրթություն:

IMPLEMENTING CONTENT AND LANGUAGE INTEGRATED LEARNING /CLIL/ APPROACH AT SCIENTIFIC AND TECHNICAL FACULTIES /STEM/

M. Yesayan

 **ORCID:** [0009-0000-2793-0660](https://orcid.org/0009-0000-2793-0660)
meri.esayan@rau.am

*Candidate of Pedagogical Sciences, Assistant Professor
Assistant Professor at the Department of the Theory of Language
and Intercultural Communication,*

*Russian-Armenian University,
Yerevan, Republic of Armenia*

ABSTRACT

The present article examines the teaching of a foreign language in STEM faculties within the framework of Content and Language Integrated Learning (CLIL). In this approach, language and content are studied simultaneously using the integration method. This provides an excellent opportunity for students to improve their language skills while maintaining and enhancing their knowledge of professional subjects. By employing the CLIL approach, educators can develop all four language skills alongside professional content in a foreign language.

Keywords: content and language integrated learning, language skills, professional content, STEM education.

Информация о статье:

статья поступила в редакцию 18 сентября 2024 г.,

подписана к печати в номер 14 (18) / 2024 – 25.12.2024 г.